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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/927,604 | 08/10/2001 | Chih-Hsiang Chen | 5083-009 | 6528 |

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EXAMINER

TOLEDO, FERNANDO L

ART UNIT PAPER NUMBER

2823

DATE MAILED: 08/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/927,604

Applicant(s)

CHEN ET AL.

Examiner

Fernando Toledo

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– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-5 and 21 is/are allowed.
- 6) ☒ Claim(s) 6-20 is/are rejected.
- 7) ☒ Claim(s) 22-26 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 6, 8 – 13 and 15 – 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Jung et al. (U. S. patent 6,335,279 B2).

In re claims 6, 12, 15 and 16 Jung in the U. S. patent 6,335,279 B2; figures 1A – 3M and related text discloses forming at least two adjacent stacks 118a and 118b over the substrate 100, the adjacent stacks having a sidewall opposing each other, wherein each of the gate stacks includes a conductive layer 116 and a capping nitride layer 120 overlying the conductive layer; selectively depositing a liner 140 over the gate stacks, so that the liner is thicker on the conductive layer than on the capping nitride layer; and forming adjacent at least two nitride spacers 142 on the liner, overlying the opposing sidewalls (Figure 3M).

In re claims 2 and 8, Jung discloses wherein the forming of the nitride spacer includes: forming a layer of nitride spacer material conformally over the liner; and etching back the layer of nitride spacer material (Figure 3M).

In re claims 5 and 10, Jung teaches wherein the liner is formed of oxide (column 7).

In re claims 9 and 17, Jung teaches wherein the adjacent nitride spacers have top, middle, and bottom spaces therebetween, and wherein the bottom space is substantially shorter than the middle space (Figure 3M).

In re claims 11 and 13, Jung teaches further including a pre-metal dielectric layer 138 overlaying the gate stacks, capping layer and nitride spacers.

In re claim 18, Jung teaches wherein the top space is wider than the middle space (Figure 3M).

In re claim 19, Jung teaches wherein the gate stacks are closely spaced to provide a gap between them, and the gate stacks, liner and sidewall spacers are covered by PMD layer, a portion of the PMD layer filling the gap (Figure 3K).

In re claim 20, Jung teaches wherein the portion of PMD layer filling the gap being free of voids (Figure 3K).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jung.

Jung does not explicitly disclose a contact plug formed within the PMD layer adjacent the gate stack.

However, Jung discloses forming a contact hole that is self aligned between the gate stacks (column 9). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form contact plugs in the contact holes formed by Jung since the plugs are required for the functionality of a CMOS device.

Claim Objections

5. Applicant is advised that should claim 22 be found allowable, claim 7 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Allowable Subject Matter

6. Claims 1 – 5 and 21 are allowed over the prior art of record.
7. The following is an examiner's statement of reasons for allowance: Jung in the U. S. patent 6,335,279 B2; substantially discloses the claimed invention. However, Jung does not disclose, teach or suggest, selectively depositing a liner over the gate stack such that the liner is deposited on the capping nitride layer at a rate lower than the rate of deposition on the conductive layer. Jung etches the liner layer making it narrower on the capping layer than on the conductive layer. There is no motivation aside from improper hindsight to say that Jung can be modified to read on the claimed invention.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

8. Applicant's arguments filed 16 May 2003 have been fully considered but they are not persuasive for the following reasons.

9. In regards to claim 6, Applicant contests that Jung does not teach wherein the liner layer is deposited directly on the conductive and capping layer.

Examiner respectfully submits that Jung discloses that the first sidewall 124 could be omitted (Column 7).

10. In regards to claims 12, 15 and 16, Applicant contests that Jung does not show the liner having a step or a transition along the boundary of the capping nitride layer and the conductive layer.

Examiner respectfully submits that Jung shows a step or transition, although small, along the boundary of the capping nitride layer and the conductive layer.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

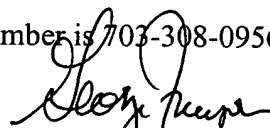
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fernando Toledo whose telephone number is 703-305-0567. The examiner can normally be reached on Mon-Fri 8am to 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 703-306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7382 for regular communications and 703-308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



FToledo
July 25, 2003



George Fourson
Primary Examiner
Art Unit 2823